DOCUMENT RESUME

ED 169 872 CS 004 629

AUTHOR Turner, Yvonne L.
TITLE Right Brain Versus Left Brain in Assessing Verbal Abilities.
PUB DATE Nov 78
NOTE 16p.; Paper presented at the Annual Meeting of the California Reading Association (12th, San Francisco, California, November 9-11, 1978); Structure of Intellect may not reproduce well due to small type

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cerebral Dominance; *Cognitive Processes; *Creativity; *Creativity Research; Creativity Tests; *Divergent Thinking; Educational Research; Elementary Secondary Education; Higher Education; *Verbal Ability

ABSTRACT

Research on divergent thinking (mental activity directed to open-end problems for which there is no one correct answer) indicates that the characteristics associated with divergency (fluency of thinking, flexibility of thinking, originality, redefinition, and elaborating) are right brain functions. To assess right brain function and verbal abilities, a study was undertaken in which subjects were directed to redraw 16 identical squares into something as interesting and creative as possible. The subjects were then asked to choose one of the drawings they had produced in the figural test and to write a short story about it. The figural test was scored on fluency, set change, transformation, and originality. The story was scored on fluency and originality. It was found that those subjects high in divergent figural units did significantly better on divergent semantics than did those low in divergent figural units. The reverse was not necessarily true. Those students high in both drawing and creative stories were not necessarily high scorers or average scorers on the Stanford Reading Comprehension test. Those students high on the divergent section made more syntactical than semantic errors on the Reading Miscue Analysis. (TJ)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED169472

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

RIGHT BRAIN VERSUS LEFT BRAIN IN ASSESSING VERBAL ABILITIES

Yvonne L. Turner, Ed.D.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Yvonne L. Turner

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

Presented at California Reading Association
Annual Conference, San Francisco, California
November 9-11, 1978

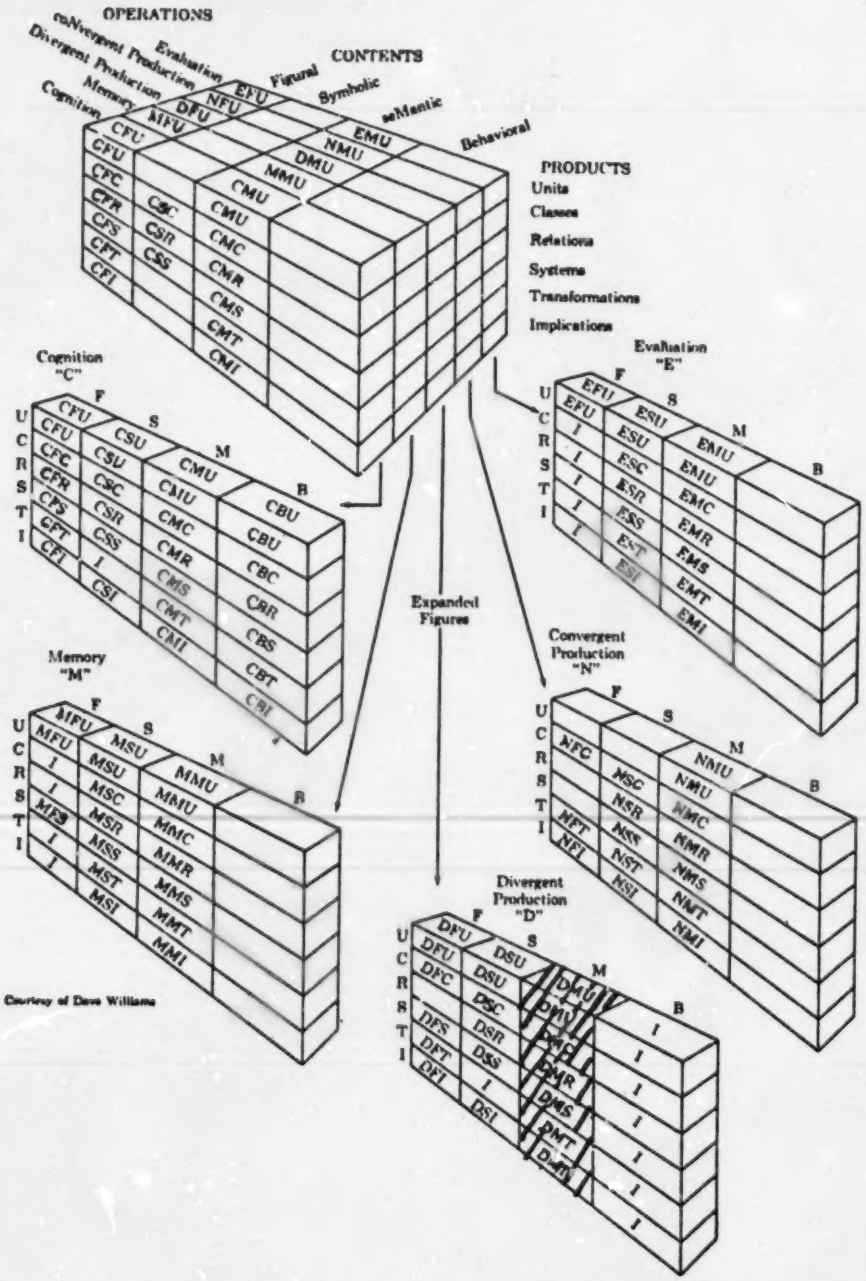
CS004429

RIGHT BRAIN VERSUS LEFT BRAIN IN ASSESSING VERBAL ABILITIES

Introduction

To do research in a particular field and later see an elaboration of such research with supportive findings from other disciplines is rewarding and pleasurable. Such has been the case in the area of divergent testing. This particular researcher began in 1976 with the testing of 75 boys in the area of divergent figural production and divergent semantic production (Turner, 1977). Divergent thinking is defined as mental activity directed to open-end kinds of problems for which there is no one correct answer. Characteristics of divergency are: (1) fluency of thinking, (2) flexibility of thinking, (3) originality, (4) redefinition, and (5) elaboration. The opposite of this type of thinking would be convergent thinking--closed-solution type (one answer problems). The individual attempts to operate according to prescribed and tested forms of analysis, method and judgment. At that time, the concerns centered on divergent thinking as a possible factor in reading test performance especially with the advent of television, the increased freedom of individual expression, emphasis on the unique individual, inclusion of creativity curriculums and cultural pluralism.

STRUCTURE OF INTELLECT



At the onset of the research work in this divergent area, there was also increased research in the field of right brain function as distinguished from left brain function and its relationship to school activities.

The left hemisphere had traditionally been known to be the speech area of the brain. Now the brain hemispheres were found to be independent as well as distinctive in function (Gazzaniga, 1972). The right hemisphere has now been recognized as visual-spatially oriented, wholistic, and concept oriented (Cook, 1977).

Rachelson found that hypothesis generation is performed by the right cerebral hemisphere and that in the generation of hypothesis, thinking is synthetic, imaginative, timeless, intuitive, metaphorical and sudden.

Osbourne in her study of bilateral EEG differentation of stimuli, found that music affects the right hemisphere (without inducing between-hemisphere changes) and that arithmetic also activates the right hemisphere if compared with the non-activating effects of words.

Blake (1976) explored two stages in the composing process (writing) that appear to correspond with the two modes of mental activity. The stage of writing a first draft involves unconscious, personal, irrational, intuitive writing and that the second stage of revising the first draft involves conscious, impersonal, rational and intellectual writing.

In "Mind, Language and Literacy," John Debes spoke

of the American educators having concentrated efforts on the left hemisphere of the brain in which the verbal language skills including reading and writing develops and ignoring the right hemisphere of the brain in which visual sequencing, visual literacy and visual patterning develop. He states that quite by accident, television has begun to cultivate the right side of the brain.

Probably Debes' most significant statement was that several schools have shown that training in visual skills can produce a marked increase in verbal skills.

The chart on page 4 summarizes some of the findings regarding right brain function as they relate to academic activity. As we look at the chart, the right brain functions are closely related to those characteristics associated with divergency.

Madeline Hunter in her article "Right-Brained Kids in Left-Brained Schools," states that "Recently, hemispheric implications have been the subject of scrutiny by educators who were looking for more efficient and effective ways of promoting learning and for ways of remediating the learning of those obviously able youngsters who were not 'getting it.'" The findings from that scrutiny powerfully suggest that schools have been beaming most of their instruction through a left-brained input (reading and listening) and output (talking and writing) system thereby handicapping all learners.

Students who learn well through left-brained input have had minimal or haphazard practice in using their right

Left Brain Function	Right Brain Function	Reference
1. Verbal language skills including reading and writing	1. Visual sequencing, visual literacy	Debes, J., 1974
2. Symbolic functions	2. Visual patterning (television has begun to cultivate the right side)	Debes, J., 1974
3. Musician process musical stimuli (sequential analytic mechanism)	3. (Non-musicians use the right brain)	Johnson, P.R., 1977
4. Analytical, verbal, symbolic functions	4. Wholistic, spatial, conceptual (goal state)	Cook, N.D., 1977
5. Relates stimuli to past experiences (asymmetry)	5. Process stimuli which are not easily identifiable or referable	David, A.E., Wada, J.A., 1977
6. Analyzes phonemes and syntax	6. Processes prosodic aspects-intonations and individual features	Assal, G., 1976
7. Informational reading of text	7. Esthetic immersion of text	Winterowd, R., 1977
8. Second stage writing of composition--conscious, impersonal, rational, intellectual	8. First stage of writing composition, ("writing for the left hand"), unconscious, personal, irrational, intuitive writing, expressive	Blake, R., 1976
	9. Hypothesis generation synthetic, imaginative, timeless, intuitive, metaphorical and sudden	Rachelson, S., 1977

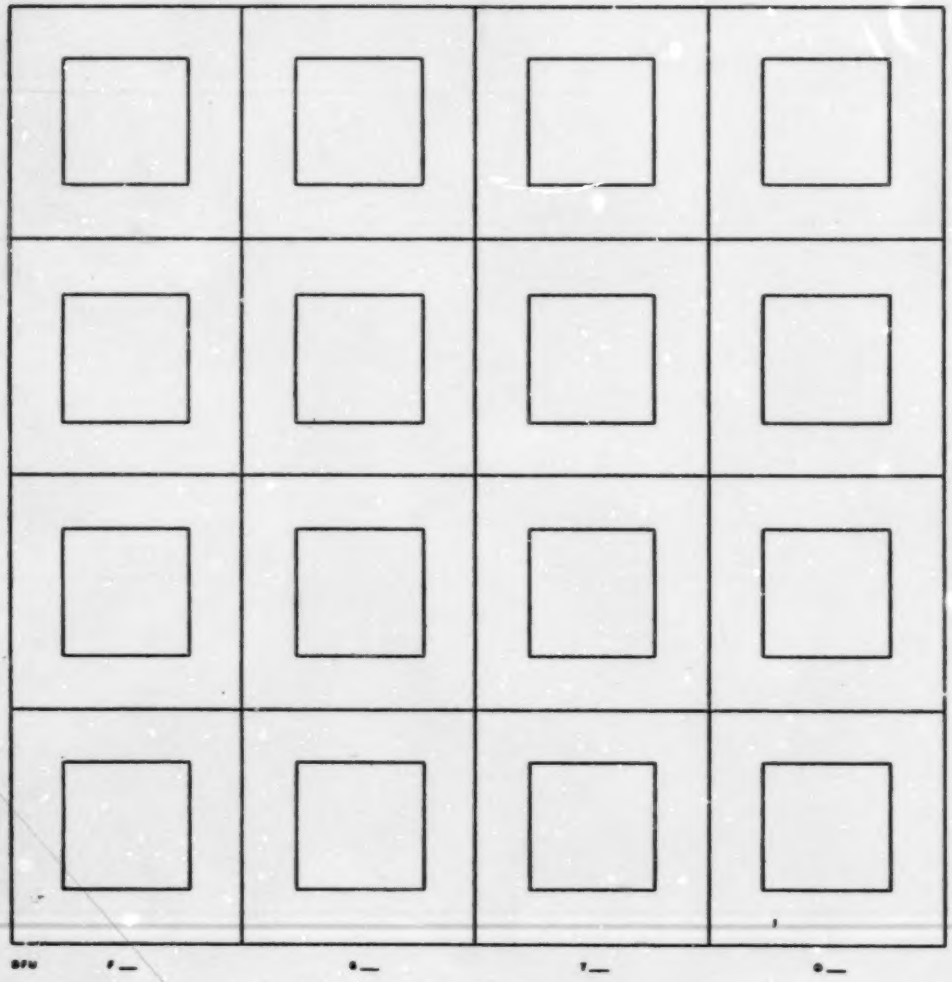
brains. Those who learn more easily with right-brained input have been handicapped by having to use primarily their left brains without the opportunity of processing the same information through their more proficient right hemisphere (Hunter, 1976, p. 47). Compare this with Meriam Meeker's statement (1969) that the intellectual inclinations of "naturally" different types of thinkers are not being differentially served by the educational system.

The researcher supports these statements and would also suggest that verbal abilities have traditionally been appraised by left brained, convergent instruments and that the right brain verbal abilities have not been assessed adequately. The divergent figural production and divergent semantics production tests of Meeker fit the criterion for assessing right brain function. The divergent figural test was visual-spatial, visual patterning, imaginative, sudden, wholistic and the divergent semantic test was a first stage writing test, personal, intuitive and expressive. The findings from the previous research (Turner, 1977) suggested the presence of verbal abilities which are not presently assessed by certain reading comprehension instruments.

Description of the SOI Learning Abilities Test

Divergent Figural Production

The test has 16 squares in which the students are directed to try to make the squares into something different--



Name: _____

Story

as interesting and creative as possible. The response is scored in four units:

1. Fluency (one point for each square used).

2. Set change (one point for each different type of response).

3. Transformation (eight points for each response using two or more squares).

4. Originality (four points for each original drawing). The criterion in this category was to give credit for a unique response that appeared once out of 30 responses.

Divergent Semantic Production

The students are directed to choose any one of the drawings that they have produced in the figural test and write a short story about it. The students do not have to give the story a title and do not have to be concerned with punctuation or spelling.

The story is scored in two units:

1. Fluency (one point for each word used).

2. Originality (ten points for each original idea or word construction that is unique in the total sample).

Time: Five minutes for divergent figural production.

Five minutes for divergent semantic production.

Selecting Findings for Original Study

1. Those high in divergent figural units do significantly better on divergent semantics than those low

in divergent figural units. This relationship is not reversible; that is, those high in divergent semantic units are not necessarily high in divergent figural units. Simply stated those students high in "drawing" objects were high in creative stories but those scoring high in creative stories were not necessarily high in "drawing."

2. Those students high in both drawing and creative stories were not necessarily high scorers or average on the Stanford Reading Comprehension test.

3. Those students high on the divergent section made more syntactical errors on the Reading Miscue Analysis rather than semantic errors which points toward Assal's study which states that the right hemisphere processes the prosodic aspects, while the left hemisphere is dominant in analysis of phonemes and syntax.

In summary, this researcher would recommend to all teachers, reading specialists and school administrators careful consideration of the recent findings on right brain function and divergency as they relate to assessing verbal abilities. Such an exploration would stimulate and excite those in the field of education to the great unexplored potential of the human brain and its verbal reservoirs and our responsibility in more effectively tapping the potential and stimulating the growth of the potential of those students entrusted in our care.

Comparison of Divergent Scores with Stanford Reading Performance (Convergent Scores)

	High Divergent DFU (figural)	High Divergent DMU (semantic)	High Convergent Stanford Silent Reading Comprehension
Student Scores	54	65	7.9
	26	63	6.3
	36	107	5.8
	42	88	5.1*
	44	71	6.4
	22	83	5.9*
	22	60	6.0
	44	83	5.2
	45	93	7.3

	High Divergent		Low Convergent
Student Scores	22	62	3.9
	29	75	3.3
	25	89	3.3
	22	61	2.9
	26	67	2.9
	32	54	4.8
	30	65	3.9
	22	102	2.0*
	25	81	3.5
	33	60	2.2
	44	88	3.8*
	24	68	4.1*
	26	59	3.9

PERCENTAGE BREAKDOWN OF MISCUE STRATEGIES RELATING TO THE TOTAL NUMBER OF MISCUES MADE

		Corrections	Graphic/Sound	Syntactical	Semantic	Deletion
DFU	Low	28%	15%	40%	22%	9%
	High	27%	14%	35%	23%	13%
DMU	Low	27%	15%	41%	23%	11%
	High	30%	13%	33%	22%	10%
DFU + DMU	Low	27%	15%	22%	40%	10%
	High	28%	13%	34%	23%	11%

BIBLIOGRAPHY

Assal, G. "Neuropsychology and Pathology of Cerebral Cortex, Bull Schwetz Akad Med Wiss 32(1-3):5-12, July 1976.

Blake, Robert W. Composing for the Left Hand: Writing Activities for the Intermediate Grades, State University College, Brockport, 1976 (ERIC Document Reproduction Services, No. ED 140344).

Cook, N.D. "Concept and Verbal Ability as Related to the Cerebral Hemispheres," Perceptual Motor Skills, 45(2): 555-66, October 1977.

Debes, John L., Mind, Languages and Literacy, Annual Convention of the National Council of Teachers of English, New Orleans, Louisiana, 1974 (ERIC Document Reproduction Service, No. ED 108659).

Gazzaniga, M. The Split Brain in Man, in Altered States of Awareness, Readings from Scientific American, W.H. Freeman and Company, San Francisco, 1972, 119-124.

Grady, Michael P. Students Need Media for a Balanced Brain, Audiovisual Instruction, 21, 9, 46-8, November 1976.

Hunter, Madeline, Right-Brained Kids in Left-Brained Schools, Today's Education, November-December, 1976, 43-48.

Johnson, P.R., Dichotically-Stimulated Ear Differences in Musicians and Nonmusicians, Cortex, 13(4):385-9, December 1977

Meeker, M. The Structure-of-Intellect: Its Interpretations and Uses. Columbus: Charles E. Merrill, 1969.

Meeker, M., L. Mestyanek, and R. Meeker, SOI Learning Abilities Test. El Segundo, California: SOI Institute, 1975.

Rachelson, Stanley E., An Identification of the Characteristics of Hypothesis Generation in Scientific Inquiry with Applications to Guided Imagery and to the Science Curriculum Improvement Study and Essence Curricula, Dissertation, Georgia State University, 1977 (ERIC Document Reproduction Services, No. ED 139649).

Turner, Yvonne, Divergent Thinking: Its Relationship to Student Performance on Selected Reading Comprehension Tests, Unpublished doctoral dissertation, University of Southern California, 1977.

Wada, J.A. and A.E. David, Fundamental Nature of Human Infants' Brain, Canadian Journal of Neurological Science, 4(3):203-7, August 1977.

Winterowd, W. Ross, Brain and Rhetoric: An Exploratory Essay, Annual Meeting of the Conference on College Composition and Communication, (Kansas City, Missouri, March 31-April 2, 1977). (ERIC Document Reproduction Services, No. ED 146588).